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# AFRICA

## Strengthening Agricultural Research in Africa

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**T**he current decline in per capita food production in Africa signals an urgent need to revitalize agricultural research. Accomplishing such a task will require addressing many issues, including demand-led approaches, accountability, building of critical mass, avoidance of duplication, sustainable financing, and capacity strengthening. This brief cannot address all these issues; instead it focuses on generating common Africa-wide goals and priorities and on collaboration for maximum impact, suggesting approaches for consideration by those responsible for African agricultural research policy and implementation.



# THE NEW PUSH FOR AGRICULTURAL DEVELOPMENT IN AFRICA

Recognizing that agriculture holds the key to Africa's development, and frustrated by insufficient progress, Africa's leaders have provided a framework for development through the New Partnership for Africa's Development (NEPAD). This framework, the Comprehensive Africa Agriculture Development Programme (CAADP), sets the broad objectives for agricultural research and development in Africa. CAADP identifies the food gap as a tremendous opportunity because as small farmers meet their own food needs they will produce surpluses for sale, thereby raising their economic status and that of their country.

The goal of CAADP is to make meaningful inroads into Africa's hunger and poverty as rapidly as possible. Its specific objectives are to increase agricultural output by an ambitious 6 percent per year for the next 20 years and, in keeping with the Millennium Development Goals, to halve the number of undernourished people in Africa by 2015.

While CAADP seeks immediate responses to the ongoing agricultural crisis, it acknowledges the need to maintain long-term competitiveness and productivity. To that end, the program consists of four components, with scientific capacity strengthening as a cross-cutting initiative:

1. Integrated natural resource management
2. Adaptive management of appropriate germplasm (animal and plant)
3. Development of sustainable markets
4. Formulation of policies for sustainable agriculture.

The consensus forming around CAADP provides an overall framework for collaboration in agricultural research for Africa's development.

## COOPERATION IN THE SUBREGIONS

There is now a widespread understanding of the need to achieve greater and more focused collaboration in agricultural research. Many constraints to agricultural development cross national borders, so national agricultural research systems (NARS) in Africa have formed subregional organizations (SROs) to raise impact through concerted actions. In turn, the SROs have formed the Forum for Agricultural Research in Africa (FARA) as an apex organization to provide continent-wide perspective on agricultural research for development. The Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) has concluded that collaborative agricultural research in East and Central Africa can address common constraints that cut across several countries; enhance complementarities and

reduce duplication; increase the efficiency of agricultural research through the optimum use of human, financial, and other research resources; and facilitate the spillover and transfer of technology among cooperating countries.

Among the recommendations emerging from ASARECA's priority-setting exercises are that the SROs should promote public- and private-sector interaction across the spectrum of research institutions, farmer organizations, cooperative movements, private research institutions, agribusiness services, nongovernmental organizations, and development institutions.

Because ASARECA serves the NARS, the association's priorities are congruent with those of its member countries and the international agricultural research centers operating in the sub-region. ASARECA and the centers of the Consultative Group on International Agricultural Research (CGIAR) in the region have agreed on eight specific themes for collaborative programs:

1. Adaptation to climate change
2. Support for policy reform
3. Agriculture, health, and nutrition
4. Management of agrobiodiversity
5. Integrated natural resource management
6. Analysis of problems, priorities, and impacts
7. Market chains
8. Improvement of learning mechanisms, capacities, and dissemination of knowledge.

The other African subregions have adopted similar priorities as they look to science to boost agricultural production and enable producers to meet the challenge of intensifying agricultural production in a sustainable manner.

The SROs believe that future research should use holistic approaches involving all stakeholders. Research should address the competitiveness of agriculture, focusing on technological options, farmer-centered research approaches, local institutional capacity building, and involvement of the private sector. These SRO priorities are providing a framework within which the wider continental goals can be adjusted to subregional circumstances.

As the research process becomes more inclusive, it must be borne in mind that the range of services required by farmers is increasing, and some specialization in the execution of those functions is still necessary. Thus, while institutional partnerships are essential to enabling agricultural change, new capacities are still needed within the evolving institutional division of labor.

## POOR UPTAKE OF PAST AGRICULTURAL RESEARCH

The traditional linear process by which the products of research are passed on to extension services for dissemination to farmers has produced many important advances, such as the control of cassava mealy bug and of

rinderpest. Much more common, however, are technologies that do not leave the research station shelves. Scientists have attributed this problem to the failure of the extension services, but such (real or perceived) shortcomings have not prevented farmers from adopting viable technologies such as hybrid maize, livestock vaccination, and smallholder dairying.

Now there is increasing recognition that some “solutions” remain on the shelves because, although they show technical potential, they are poorly adapted to the complex situations within which they are intended to be adopted. Farming systems research, which emphasizes on-farm experimentation, has had considerable success locally. With farmers involved in testing, many innovations have been shown to work on participating farms. But these innovations have typically failed to spread even to neighboring localities—as exemplified by the case of the ox-drawn broadbed maker in Ethiopia, which was designed to make raised seedbeds with intervening furrows that drain the land to permit early planting. With the right seed varieties and fertilizer, this method raises crop yields significantly. The implement was developed over many years of on-farm testing, but after initial promise it failed to be adopted as widely as had been anticipated.

One plausible explanation for the poor uptake of research products is the existence of critical gaps in the knowledge of research teams. If farming communities had been more involved in designing and validating the research on the broadbed makers (in addition to providing fields and labor), local farmers may well have predicted the poor uptake of this technology. They would have known about the unreliability of essential inputs such as fertilizer and the effects of market failures on the price of grain in case of local production increases.

In an announcement on the subject, the International Service for National Agricultural Research eloquently stated the case for a new approach:

*The key drive now behind the innovations is the need to develop solutions to new economic, political, and social problems that directly and indirectly influence agriculture. The dominant model now is one that views national agricultural research systems within an innovation systems framework, recognizing the need for the integration of research, extension and education, farmers, and nongovernmental organizations around a common goal: the generation, dissemination, and the use of the innovations. Such integration emphasizes a non-linear pattern of interaction and feedback between research and development, and other related organizations.*

## INTEGRATED APPROACH TO AGRICULTURAL RESEARCH

The CGIAR Challenge Program concept is a response to the need for innovative, high-impact research involving a wider array of partners and attracting new funding sources.

The Integrated Agricultural Research for Development (IAR4D) concept, adopted by the proposed Sub-Saharan Africa Challenge Program led and coordinated by FARA, provides an example of how such an approach can work. IAR4D carries out research in a demand-driven mode, with impact measured in terms of meeting that demand, rather than in the supply-driven mode that has characterized much agricultural research in the past. IAR4D asks fundamental questions about the type of research needed and the social organization and attitudes and behaviors of the participants.

Past research has frequently failed to accommodate the complexity of the situations in which products must be adopted. IAR4D attempts to overcome this failure by addressing the following key elements:

- Integrating levels of analysis
- Merging disciplinary perspectives
- Guiding research on component technologies while making use of a wide range of technological options
- Generating policy, technological, and institutional options
- Improving the adaptive capacity of stakeholders to manage the resilience of the agroecosystem
- Moving from training to social learning
- Advancing knowledge management
- Increasing awareness of the environmental costs of poor natural resource management.

IAR4D projects are to include specific measures to ensure that the research benefits will scale out and up. Projects will involve community members beyond those on the farms or premises where the research is conducted, in order to get their intellectual input and to ensure that they are aware of and take ownership of the emerging research products. Special attention will be paid to overcoming gender bias and finding ways to institutionalize modes of scaling out and up that target female as well as male farmers. Policymakers at national and regional levels will also be involved and kept informed of the outcomes of IAR4D projects. This wide scope aims to help spread research benefits to neighboring communities, and to internalize such benefits in institutions at local, national, and regional levels. These objectives influence the biophysical, socioeconomic, and institutional aspects of IAR4D at all levels.

IAR4D recognizes that it is essential to work across a variety of scales because many phenomena are scale sensitive, and the rules of aggregation and interaction change with shifts in scale. Criteria will be defined for assessing practices, technologies, and systems at different scales.

IAR4D also requires teams of scientists from many disciplines to work together as learning organizations with farmers and the full range of other stakeholders in highly adaptive ways. The formation of such teams demands institutional flexibility and willingness to change. It also implies a substantial need for capacity building, with funding for team building as a primary element of proposal development and project implementation. It will also require professional facilitation to

enable partners from different cultures, dissimilar educational backgrounds, and unequal endowments to collaborate effectively.

Figure 1 illustrates how all the stakeholders, from farmers and communities to international institutions, play essential roles in achieving impact through scaling out and up. The task of the Sub-Saharan Africa Challenge Program and other programs is to internalize the new approach in the partner institutions and facilitate the changes that they will have to make.

# CONCLUSION

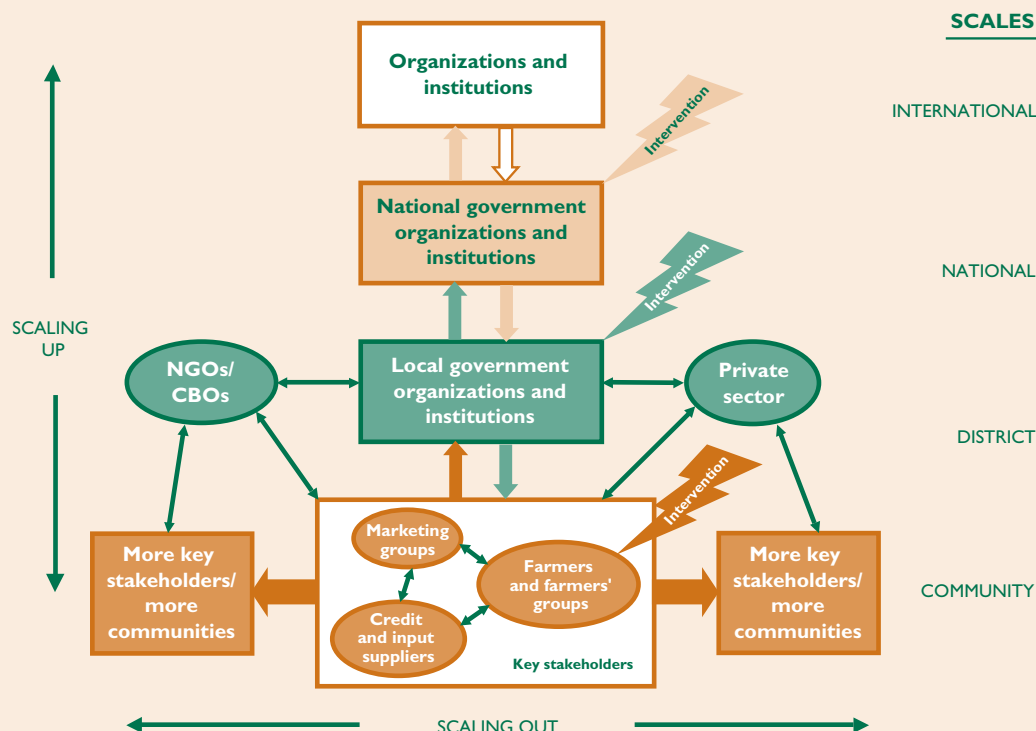
The changes that must be made in order to ensure the successful implementation of the IAR4D approach to agricultural research will be easier for research centers to embrace if their trend is away from commodity- and technology-driven research and toward research that begins with the participatory identification of opportunities for smallholder

farmers. A similar evolution is taking place among the NARS.

The specific changes needed for particular research programs cannot be prescribed, however, because they are yet to be proven and, more fundamentally, because flexibility and pragmatism will be essential in ensuring that new approaches are tailored to the particular backgrounds and needs of different research teams. What is certain is that without fundamental change in the way agricultural research is conducted in Africa, advances will not reach the scale required to reverse the downward spiral of food availability and rural incomes in Africa.

**For further reading:**  
[www.fara-africa.org](http://www.fara-africa.org)

**FIGURE 1 Major Components of Scaling IAR4D Up and Out**



Source: B. Douthwaite, T. Kuby, E. van de Fliert, and S. Schulz, "Bridging the Attribution Gap: An Evaluation Approach for Achieving and Attributing Impact," *Agricultural Systems* 78 (2004, in press).

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